
Special Provision to Item 348

Thin Bonded Friction Courses



For this project, Item 348, "Thin Bonded Friction Courses," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Section 348.4.1., "Certification." The paragraph is voided and replaced by the following.

Certification. Personnel certified by the Department-approved hot-mix asphalt certification program must conduct all mixture designs, sampling, and testing in accordance with Table 6. Supply the Engineer with a list of certified personnel and copies of their current certificates before beginning production and when personnel changes are made. Provide a mixture design developed and signed by a Level 2 certified specialist. Provide Level 1A certified specialists at the plant during production operations. Provide Level 1B certified specialists to conduct placement tests. Provide Level AGG101 certified specialists for aggregate testing.

Table 6, "Test Methods, Test Responsibility, and Minimum Certification Levels" is voided and replaced by the following.

Table 6
Test Methods, Test Responsibility, and Minimum Certification Levels

Test Description	Test Method	Contractor	Engineer	Level ¹
1. Aggregate and Recycled Material Testing				
Sampling	Tex-221-F	✓	✓	1A/AGG101
Dry sieve	Tex-200-F , Part I	✓	✓	1A/AGG101
Washed sieve	Tex-200-F , Part II	✓	✓	1A/AGG101
Deleterious material	Tex-217-F , Parts I & III	✓	✓	AGG101
Decantation	Tex-217-F , Part II	✓	✓	AGG101
Los Angeles abrasion	Tex-410-A		✓	TxDOT
Magnesium sulfate soundness	Tex-411-A		✓	TxDOT
Micro-Deval abrasion	Tex-461-A		✓	AGG101
Crushed face count	Tex-460-A	✓	✓	AGG101
Flat and elongated particles	Tex-280-F	✓	✓	AGG101
2. Asphalt Binder & Tack Coat Sampling				
Asphalt binder sampling	Tex-500-C , Part II	✓	✓	1A/1B
Membrane sampling	Tex-500-C , Part III	✓	✓	1A/1B
3. Mix Design & Verification				
Design and JMF changes	Tex-204-F	✓	✓	2
Mixing	Tex-205-F	✓	✓	2
Molding (SGC)	Tex-241-F	✓	✓	1A
Laboratory-molded density	Tex-207-F , Parts I, VI, & VIII	✓	✓	1A
Rice gravity	Tex-227-F , Part II	✓	✓	1A
Ignition oven correction factors ²	Tex-236-F , Part II	✓	✓	2
Drain-down	Tex-235-F	✓	✓	1A
Hamburg Wheel test	Tex-242-F	✓	✓	1A
Overlay test	Tex-248-F		✓	TxDOT
Boil test	Tex-530-C	✓	✓	1A
Cantabro loss	Tex-245-F	✓	✓	1A
4. Production Testing				
Control charts	Tex-233-F	✓	✓	1A
Mixture sampling	Tex-222-F	✓	✓	1A/1B
Gradation & asphalt binder content ²	Tex-236-F , Part I	✓	✓	1A
Moisture content	Tex-212-F , Part II	✓	✓	1A/AGG101
Micro-Deval abrasion	Tex-461-A		✓	AGG101
Drain-down	Tex-235-F	✓	✓	1A
Boil test	Tex-530-C	✓	✓	1A
Abson recovery	Tex-211-F		✓	TxDOT
5. Placement Testing				
Control charts	Tex-233-F	✓	✓	1A
Ride quality measurement	Tex-1001-S	✓	✓	Note 3
Thermal profile	Tex-244-F	✓	✓	1B
Permeability	Tex-246-F	✓	✓	1B

- Level 1A, 1B, AGG101, and 2 are certification levels provided by the Hot Mix Asphalt Center certification program.
- Refer to Section 348.4.5., "Production Operations," for exceptions to using an ignition oven.
- Profiler and operator are required to be certified at the Texas A&M Transportation Institute facility when Surface Test Type B is specified.

Table 8, “Laboratory Mixture Properties for Permeable Friction Course,” is voided and replaced by the following.

Table 8
Laboratory Mixture Design Properties

Mixture Property	Test Method	PG 76 Mixtures		A-R Mixtures	Thin Bonded Wearing Course		
		Fine (PFC-F)	Coarse (PFC-C)	Coarse (PFCR-C)	Type A	Type B	Type C
Asphalt binder content, %	–	6.0–7.0	6.0–7.0	7.0–9.0	5.0–5.8	4.8–5.6	4.8–5.6
Film thickness, microns	–	–	–	–	9.0 Min	9.0 Min	9.0 Min
Design gyrations (Ndesign)	Tex-241-F	50	50	50	50	50	50
Laboratory-molded density, %	Tex-207-F	78.0 Max	82.0 Max	82.0 Max	92.0 Max	92.0 Max	92.0 Max
Hamburg Wheel test, ¹ passes at 12.5 mm rut depth	Tex-242-F	10,000 Min	–	–	–	–	–
Overlay test, ¹ number of cycles	Tex-248-F	200 Min	–	–	–	–	–
Drain-down, %	Tex-235-F	0.10 Max	0.10 Max	0.10 Max	0.10 Max	0.10 Max	0.10 Max
Fiber content, % by wt. of total PG 76 mixture	Calculated	0.20 ² –0.50	0.20 ² –0.50	–	–	–	–
Lime content, % by wt. of total aggregate	Calculated	1.0 ³	1.0 ³	–	–	–	–
CRM content, % by wt. of A-R binder	Calculated	–	–	15.0 Min	–	–	–
Boil test ⁴	Tex-530-C	–	–	–	–	–	–
Cantabro loss, %	Tex-245-F	20.0 Max	20.0 Max	20.0 Max	20.0 Max	20.0 Max	20.0 Max

1. Mold test specimens to Ndesign at the optimum asphalt binder content (JMF1).
2. When at least 3% RAS is used in the mixture, the Contractor may reduce the amount of fibers to at least 0.10% provided the mixture meets the drain-down requirement.
3. Unless otherwise shown on the plans or waived by the Engineer based on Hamburg Wheel results.
4. Used to establish baseline for comparison to production results. May be waived when approved.

Table 9, “Testing Frequency and Mixture Production Tolerances,” is voided and replaced by the following.

Table 9
Testing Frequency and Mixture Production Tolerance

Test Description	Test Method	Minimum Contractor Testing Frequency	Minimum Engineer Testing Frequency	Operational Tolerance from Current JMF
Individual % retained for sieve sized larger than #200	Tex-200-F	1 per subplot	1 per 12 sublots	±5.0 ¹
% passing the #200 sieve				±2.0 ¹
Laboratory-molded density, %	Tex-207-F , Part VIII	1 per subplot	1 per lot	Table 8
Asphalt binder content, %	Tex-236-F ²	1 per subplot	1 per lot ³	±0.3 ⁴
Drain-down, %	Tex-235-F	1 per subplot	1 per 12 sublots	Table 8
Boil test ⁵	Tex-530-C	1 per project	1 per project	N/A
Membrane application rate	Tex-247-F	1 per lot	1 per 4 lots	±0.02
Cantabro loss, %	Tex-245-F	1 per project (sample only)	1 per project	Table 8
Asphalt binder sampling	Tex-500-C , Part II	1 per lot (sample only)	1 per project	N/A
Emulsion membrane sampling and testing	Tex-500-C , Part III	1 per lot (sample only)	1 per project	N/A
Thermal profile	Tex-244-F	1 per subplot	1 per project ⁶	N/A

1. Only applies to mixture produced for Lot 1 and higher. Aggregate gradation is not allowed to be outside the limits shown in Table 7.
2. Ensure the binder content determination excludes fibers. Add the recycled binder content to the flow meter readout when the asphalt mass flow meter is used to determine binder content.
3. May be obtained from asphalt mass flow meter readouts.
4. Asphalt binder content is not allowed to be outside the limits shown in Table 8.
5. The Engineer may reduce or waive the sampling and testing requirements based on a satisfactory test history.
6. Not required when a thermal imaging system is used.

Section 348.4.5.2., “Mixing and Discharge of Materials.” The first paragraph is voided and replaced by the following.

Notify the Engineer of the target discharge temperature and produce the mixture within 25°F of the target. Monitor the temperature of the material in the truck before shipping to ensure that it does not exceed 350°F (or 275°F for WMA). The Department will not pay for or allow placement of any mixture produced above 350°F.

Section 348.4.7., “Placement Operations.” The second paragraph is voided and replaced by the following.

Prepare the surface by removing raised pavement markers and objectionable material such as moisture, dirt, sand, leaves and other loose impediments from the surface before placing mixture. Remove vegetation from pavement edges. Do not allow any loose mixture onto the prepared surface before application of the membrane. Place the mixture to meet the typical section requirements and produce a smooth, finished surface with a uniform appearance and texture. Offset longitudinal joints of successive courses of hot-mix by at least 6 in. Place mixture so that longitudinal joints on the surface course coincide with lane lines, or as directed. Ensure that all finished surfaces will drain properly.

Section 348.4.7.3.1.3., “Thermal Camera,” is voided and replaced by the following.

Take immediate corrective action to eliminate recurring moderate thermal segregation when a hand-held thermal camera is used. Provide the Engineer with the thermal profile of every subplot within one working day of the completion of each lot. When requested by the Engineer, provide the electronic files generated using the thermal camera. Report the results of each thermal profile in accordance with Section 348.4.2., “Reporting and Responsibilities.” The Engineer will use a hand-held thermal camera to obtain a thermal profile at least once per project. Suspend operations and take immediate corrective action to eliminate severe thermal segregation unless otherwise directed. Resume operations when the Engineer determines that subsequent production will meet the requirements of this Section.